2010–2012 Residential Fire Loss Estimates*

U.S. National Estimates of Fires, Deaths, Injuries, and Property Losses from Unintentional Fires

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Executive Summary

This report presents estimates of consumer product-related fire losses that occurred in U.S. residential structure fires attended by the fire service. The estimates were derived from data for 2010 through 2012, provided by the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA) Survey of Fire Departments for U.S. Fire Experience.

The fire and fire loss estimates presented in this report pertain to unintentional residential structure fires and civilian casualties. These estimates show that there were:

- 364,300 fires, 2,330 deaths, 12,910 injuries, and $6.63 billion in property loss in 2010;
- 365,500 fires, 2,240 deaths, 13,400 injuries, and $6.46 billion in property loss in 2011;
- 351,400 fires, 1,960 deaths, 11,860 injuries, and $6.38 billion in property loss in 2012; and
- an estimated annual average of 360,400 fires, 2,170 deaths, 12,720 injuries, and $6.49 billion in property loss over the three-year period 2010–2012.

Consumer products involved in fires can be categorized as sources of ignition or as the materials first ignited. Sources of ignition can be small, such as candles, or large sources like ranges. The larger sources of ignition, which are operating equipment, are identified in NFIRS as equipment. Smaller sources, that are not equipment, such as candles, matches, and lighters, are identified as heat sources. Because the fire losses are derived separately for sources of ignition and materials first ignited, estimates presented in this report can overlap in some cases. For example, a fire can count as both a candle fire and a mattress fire.

For 2010 through 2012, the relative ranking of the greatest contributors remained largely unchanged from that reported for 2009–2011. Tables 1a–1d show that:

- Cooking equipment accounted for the largest percentage of fires. An estimated annual average of 149,000 cooking equipment-related fires during 2010–2012 accounted for 41.3 percent of the average annual estimate of total residential fires for the same period. The corresponding death estimate is an annual average of 170 deaths, which is 7.7 percent of the average annual estimate of total residential fire deaths. The annual average number of cooking fire injuries for 2010–2012 was estimated to be 3,540, which represents 27.8 percent of the total estimated annual average number of injuries for the same time period. Much of these losses were associated with range and oven fires.

- Heating and cooling equipment fires constituted the second largest share of total residential fires. The estimated annual average of 45,300 fires for 2010–2012 was 12.6 percent of the annual average estimate of total residential fires during the same period. The corresponding death estimate is an annual average of 190 deaths, which is 8.7 percent of the average annual estimated number of total residential fire deaths. The corresponding injuries for the three years averaged to an annual estimate of 900. This accounts for 7.1 percent of the annual average estimate of total injuries during 2010–2012.

- During 2010–2012, an estimated annual average of 9,600 fires was attributable to electrical distribution equipment (*e.g.*, installed wiring, lighting). This is 2.7 percent of the estimated annual average number of residential fires for this period. The annual average death estimate is 130 (6.0 percent of average annual estimated residential fire deaths); the injury estimates averaged 470, which is 3.7 percent of the estimated annual average of residential fire injuries.

- With respect to item first ignited, upholstered furniture was involved in the greatest number of fire deaths. From 2010 through 2012, an estimated annual average of 390 deaths was associated with these fires. This constitutes 18.0 percent of the estimated annual average of total deaths associated with residential structure fires for the same period. On average, during 2010 to 2012, mattress or bedding ignitions accounted for an annual average of 340 deaths, which is 15.5 percent of the average annual estimated number of total residential fire deaths.

- With respect to heat source, smoking materials were the largest contributor to deaths, associated with an annual average of 430 deaths from 2010 to 2012. This is 19.8 percent of the estimated annual average of total residential fire deaths. Smoking materials, however, comprise only 3.0 percent of the total estimated residential fires. Among products that are heat sources, candles were involved the second highest number of deaths. The estimated annual average of deaths from candle fires is 80, which is 3.8 percent of the average estimated total number of residential fire deaths from 2010 to 2012. Candles account for an estimated 1.8 percent of the fires. There were an estimated 70 deaths from lighter fires (3.3 percent of the estimated annual average of total residential fire deaths) while they are only involved in an estimated 0.5 percent of the fires. On average, matches were responsible for 10 deaths, or 0.4 percent of total deaths annually. They were involved in only 0.2 percent of residential fires.

- The estimates for fire injuries rose and then fell during the 2010–2012 time period from 12,910 in 2010 to 13,400 in 2011, and then down to 11,900 in 2012.

The USFA implemented a new coding rule for NFIRS cases, beginning with 2012 data. The new coding rule states that if the Heat Source or the Factor Contributing to Ignition coded implies there was equipment involved, the Equipment Involved in Ignition must be coded and cannot be coded as "NNN – No equipment." For example, if the heat source was coded as "13 – Arcing," the coder must code the equipment involved. This appears to have impacted the data in two ways. First, 2012 saw areduced proportion of fires coded with Heat Source codes that imply there was an equipment involved[1]. Second, there was an increase in the coding of specific equipment codes, particularly electrical equipment, and reduced the proportion of missing equipment data.

Given the large proportion of missing data in NFIRS (see Tables 9a-9d on page 32) that must be imputed, the questionnaire change would substantially alter estimates based on heat source or equipment involved, unless an adjustment is made to account for the questionnaire change. Therefore, an adjustment was made to the raw counts for electrical equipment involved, electrical heat sources, and the proportion of missing values for the equipment and heat source variables. This was done before imputation to match historically observed proportions to prevent estimates from being altered dramatically (and implausibly) by this design change. However, these adjustments alone cannot fully account for the impact of the change. Interpretations of changes (or lack thereof) in estimates between 2011 and 2012

[1] There are four of these heat source codes: "10 – Heat from powered equipment, other"; "11 – Spark, ember, or flame from operating equipment"; "12 – Radiated, conducted heat from operating equipment"; and "13 – Arcing."

should be done with caution. There were evident changes in the proportion of certain incident types in 2012, for example, an increase in the number of fires coded as confined cooking fires (Incident Type 113), but it is unclear if this was related to the questionnaire change, so no adjustment was made related to incident type.

Introduction

The fire loss estimates presented in this report are based on the National Fire Protection Association's (NFPA) national fire loss estimates[2] and the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) data. The NFPA makes national estimates of fires, deaths, injuries, and property loss based on a probability sample survey of U.S. fire departments. The NFIRS is a compilation of fire incident reports submitted voluntarily to the USFA by U.S. fire departments. Not all the states reporting include data from all fire departments in the state. Among the multitude of information collected, product-specific information, such as the equipment involved in the ignition of the fire, or the item that was first ignited in the fire, is available in NFIRS data. The NFIRS product-specific frequency counts are weighted up to the NFPA estimates for total U.S. fire losses, to arrive at the estimates that are presented in this report.

The estimated number of fires and fire loss estimates pertain to fires in residential properties only. These properties include single-family and multifamily dwellings. Mobile and motor homes, while used as a structure and not in transit, are also included. Injury and death estimates pertain to civilian casualties only. The property losses include property and content losses, as estimated by fire departments. For convenience, property and content losses are referred to as "property losses" in this report.

CPSC staff has been producing estimates of residential fires and related deaths, injuries, and property losses since the early 1980s. However, over the years, NFIRS has undergone major changes. This, in turn, has necessitated changes in the way CPSC analysts produce the product-specific estimates. Beginning with 1999 data, a major revision to the NFIRS data coding system, designated version 5.0, was implemented. In 1999, 5 percent of the residential fire data were coded by fire departments in the new NFIRS version 5.0; in 2000, 20 percent of the data were coded in version 5.0. The proportion increased to 50 percent in 2001; 70 percent in 2002; 80 percent in 2003; 89 percent in 2004; 94 percent in 2005; 95 percent in 2006; 97 percent in 2007, 99 percent in 2008; and 100 percent in 2009, 2010, 2011, and 2012. However, from 1999 forward, the NFIRS data received from the USFA are entirely in version 5.0 format. Data were converted from NFIRS 4.1 to NFIRS 5.0 by computer programs. Because version 5.0 has many more data fields than version 4.1, and some of the new data fields have many more choices than in 4.1, the converted data are not likely to be the same as data originally coded in version 5.0.

As mentioned, in 2010, 2011, and 2012, all of the residential fire data were originally coded in version 5.0. The data were weighted up to the 2010, 2011, and 2012 NFPA estimates for total U.S. fire losses, to arrive at the product-specific estimates presented in this report.

[2] M.J. Karter, "Fire Loss in the U.S. During 2010," National Fire Protection Association (NFPA), September 2011; M.J. Karter, "Fire Loss in the U.S. During 2011," National Fire Protection Association (NFPA), September 2012; M.J. Karter, "Fire Loss in the U.S. During 2012," National Fire Protection Association (NFPA), September 2013.

Beginning with version 5.0, NFIRS introduced newly created codes to identify confined fires (those that do not spread beyond the originating item). To encourage the reporting of these fires, NFIRS requires only limited information. From 1999 onward, as the use of version 5.0 increased, an increasingly large number of confined fires were reported. In 1999, about 2 percent of residential structure fires were reported as confined; by 2012, 48 percent of residential structure fires reported to NFIRS were confined.

In confined fire cases, frequently it is not possible to determine the type of equipment involved because the equipment involvedis rarely coded. For example, when a fire is identified as a "confined cooking fire" in NFIRS, it is rarely possible to distinguish a fire started by a range versus other cooking equipment, like a microwave oven or toaster. As a result, confined cooking fire losses are only included as part of the "Total Cooking Equipment" fires, but they are not included in subcategories that define the equipment involved or the power source. Because ranges certainly are involved in some confined fires, their contribution should be taken into account in the evaluation of the cooking fire hazard. The same is true for microwave ovens and other cooking equipment.

The changes cited above, and the gradual implementation of these changes in the NFIRS data system, have affected considerably the estimates of residential fires and related deaths, injuries, and property losses since 1999. Therefore, CPSC staff strongly discourages comparison of pre-1999 estimates with estimates from subsequent years.

Results

Consistent with previous years' reports, CPSC staff has presented data here using five main tables. Each numbered table (1–5) has four sub-tables associated with it: Table "a" presents the fire estimates; "b" presents the death estimates; "c" presents the injury estimates; and "d" presents the property loss estimates. As in previous years, only selected product-specific estimates are included in these tables. Therefore, the detail may not add up to the totals that appear in the headings. All of the product categories in the tables, with the exception of smoking materials, contain products within the jurisdiction of the CPSC. Intentionally set fires and their associated losses, which include the deliberate misuse of heat sources, or fires of an incendiary nature, are excluded from the estimates.

In Tables 1, 3, 4, and 5, equipment codes were used to identify the products involved; while in Table 2, either the heat source or the item first ignited was the primary means of identifying the product. As such, some estimates provided in the different sections of the tables overlap. For example, in Table 2, estimates of fires involving cigarette ignition of upholstered furniture are included in the estimates for cigarettes (by heat source), as well as in the estimates for upholstered furniture-smoking material ignition (by item first ignited). Additional details about the estimates and the data system are included in the Methodology section of this report.

TABLE 1a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[3]	**364,300**	**365,500**	**351,400**	**360,400**
Total Heating and Cooling Equipment[2]	**48,600**	**45,400**	**41,800**	**45,300**
Local Fixed Heater	4,000	3,900	3,700	3,900
Portable Heater	1,600	1,400	1,100	1,400
Central Heating	1,000	900	600	800
Fireplace, Chimney, Chimney Connector[2]	24,400	22,500	21,200	22,700
Water Heater	1,800	1,900	1,500	1,700
Air Conditioning	1,100	1,100	1,200	1,100
Other[2]	15,600	14,500	13,300	14,500
Total Cooking Equipment[2]	**147,000**	**146,900**	**153,000**	**149,000**
Range/Oven	13,600	13,500	13,200	13,400
Gas	*1,900*	*1,900*	*1,800*	*1,900*
Electric	*11,600*	*11,600*	*11,300*	*11,500*
Other	*	*	*	*
Microwave Oven	500	600	600	600
All Other Cooking	3,000	3,300	4,100	3,500
Gas	*800*	*1,000*	*900*	*900*
Electric	*2,000*	*2,100*	*2,900*	*2,300*
Other	*200*	*200*	*400*	*300*
Total Electrical Distribution	**9,400**	**9,800**	**9,500**	**9,600**
Installed Wiring	3,700	3,900	4,400	4,000
Cord, Plug	900	1,100	900	1,000
Receptacle, Switch	1,100	1,200	1,200	1,200
Lighting	1,900	1,900	1,400	1,700
Other	1,700	1,700	1,500	1,600
Other Selected Equipment	**9,100**	**9,400**	**7,700**	**8,700**
Audio/Visual Equipment	300	400	300	400
Clothes Dryer	6,200	6,600	5,100	6,000
Dishwasher	500	400	400	400
Washing Machine	300	200	200	200
Torch	400	400	400	400
Refrigerator/Freezer	700	700	600	700
Shop/Garden Tool	700	700	600	700

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Rounded estimates of fewer than 100 fires are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[3] There are confined fire estimates included in *Total Residential*, *Total Heating and Cooling Equipment*, *Fireplace, Chimney, Chimney Connector*, *Other*, and *Total Cooking Equipment* categories. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment and power source. See Table 8a on p. 31 for details.

TABLE 1b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[4]	**2,330**	**2,240**	**1,960**	**2,170**
Total Heating and Cooling Equipment	**200**	**160**	**210**	**190**
Local Fixed Heater	40	60	80	60
Portable Heater	100	40	70	70
Central Heating	10	10	20	10
Fireplace, Chimney, Chimney Connector[3]	10	30	20	20
Water Heater	30	*	*	10
Air Conditioning	10	*	10	10
Other[3]	*	10	20	10
Total Cooking Equipment[3]	**180**	**190**	**130**	**170**
Range/Oven	170	150	100	140
Gas	*50*	*40*	*10*	*40*
Electric	*120*	*110*	*90*	*110*
Other	*	*	*	*
Microwave Oven	*	*	*	*
All Other Cooking	10	40	20	20
Gas	*10*	*10*	*10*	*10*
Electric	*	*30*	*20*	*20*
Other	*	*	*	*
Total Electrical Distribution	**140**	**120**	**130**	**130**
Installed Wiring	30	50	80	50
Cord, Plug	60	40	30	40
Receptacle, Switch	10	*	*	*
Lighting	30	20	10	20
Other	10	10	10	10
Other Selected Equipment	**20**	**10**	**20**	**20**
Audio/Visual Equipment	*	*	*	*
Clothes Dryer	10	*	10	*
Dishwasher	*	*	*	*
Washing Machine	10	*	*	*
Torch	*	*	*	*
Refrigerator / Freezer	*	10	10	10
Shop/Garden Tool	10	*	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

[4] There were no NFIRS confined cooking fire deaths in 2010 or 2012 and a rounded estimate of fewer than 10 in 2011. There were no confined fire deaths in the Heating and Cooling Other Equipment category in 2010, 2011, or 2012.

TABLE 1c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[5]	**12,910**	**13,400**	**11,860**	**12,720**
Total Heating and Cooling Equipment[4]	**940**	**980**	**790**	**900**
Local Fixed Heater	260	390	340	330
Portable Heater	190	160	90	150
Central Heating	50	20	40	30
Fireplace, Chimney, Chimney Connector[4]	120	90	60	90
Water Heater	90	90	50	70
Air Conditioning	40	70	80	60
Other[4]	210	200	180	200
Total Cooking Equipment[4]	**3,560**	**3,580**	**3,470**	**3,540**
Range/Oven	1,510	1,650	1,390	1,520
Gas	*210*	*170*	*180*	*190*
Electric	*1,290*	*1,480*	*1,200*	*1,320*
Other	*	*	*10*	*
Microwave Oven	30	50	30	40
All Other Cooking	210	240	360	270
Gas	*70*	*60*	*80*	*70*
Electric	*120*	*160*	*260*	*180*
Other	*20*	*20*	*20*	*20*
Total Electrical Distribution	**500**	**440**	**460**	**470**
Installed Wiring	140	130	170	140
Cord, Plug	110	70	80	90
Receptacle, Switch	20	70	60	50
Lighting	130	100	90	110
Other	90	70	70	80
Other Selected Equipment	**280**	**430**	**320**	**340**
Audio/Visual Equipment	20	30	40	30
Clothes Dryer	190	260	180	210
Dishwasher	*	10	20	10
Washing Machine	10	*	10	*
Torch	30	40	20	30
Refrigerator/Freezer	10	60	40	40
Shop/Garden Tool	20	40	20	30

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[5] There are confined fire injury estimates included in *Total Residential*, *Total Heating and Cooling Equipment*, *Fireplace*, *Chimney*, *Chimney Connector*, *Other*, and *Total Cooking Equipment* categories. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment. See Table 8b on p. 32 for details.

TABLE 1d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[6]	**$6,627.6**	**$6,457.1**	**$6,380.7**	**$6,488.5**
Total Heating and Cooling Equipment[5]	**$579.7**	**$466.5**	**$425.2**	**$490.5**
Local Fixed Heater	$109.3	$106.8	$100.4	$105.5
Portable Heater	$85.6	$44.7	$52.1	$60.8
Central Heating	$28.3	$35.0	$19.2	$27.5
Fireplace, Chimney, Chimney Connector[5]	$153.6	$87.9	$93.6	$111.7
Water Heater	$37.8	$53.1	$31.4	$40.7
Air Conditioning	$30.2	$27.7	$32.9	$30.3
Other[5]	$158.6	$126.9	$116.2	$133.9
Total Cooking Equipment[5]	**$404.6**	**$409.9**	**$474.1**	**$429.5**
Range/Oven	$254.2	$253.4	$304.6	$270.7
Gas	*$39.6*	*$32.6*	*$38.6*	*$36.9*
Electric	*$213.9*	*$220.8*	*$265.4*	*$233.4*
Other	*$0.6*	*	*$0.7*	*$0.4*
Microwave Oven	$9.6	$8.8	$11.3	$9.9
All Other Cooking	$113.8	$120.9	$131.2	$122.0
Gas	*$49.7*	*$44.2*	*$47.1*	*$47.0*
Electric	*$55.0*	*$54.1*	*$73.3*	*$60.8*
Other	*$9.2*	*$22.6*	*$10.8*	*$14.2*
Total Electrical Distribution	**$311.1**	**$340.2**	**$334.1**	**$328.5**
Installed Wiring	$137.8	$143.6	$170.2	$150.5
Cord, Plug	$35.8	$39.8	$35.9	$37.1
Receptacle, Switch	$26.4	$33.1	$34.5	$31.3
Lighting	$51.6	$50.0	$40.1	$47.2
Other	$59.5	$73.8	$53.4	$62.3
Other Selected Equipment	**$177.5**	**$169.0**	**$164.1**	**$170.2**
Audio/Visual Equipment	$6.6	$8.4	$14.7	$9.9
Clothes Dryer	$76.4	$81.4	$80.1	$79.3
Dishwasher	$11.4	$11.0	$11.1	$11.2
Washing Machine	$2.7	$2.1	$2.5	$2.4
Torch	$13.2	$12.4	$12.8	$12.8
Refrigerator/Freezer	$34.0	$17.8	$20.6	$24.1
Shop/Garden Tool	$34.5	$36.9	$22.9	$31.4

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[6] There are confined fire property loss estimates included in *Total Residential*, *Total Heating and Cooling Equipment*, *Fireplace, Chimney, Chimney Connector, Other*, and *Total Cooking Equipment* categories. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment. See Table 8c on p. 32 for details.

TABLE 2a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED PRODUCTS, 20010–2012

Product	2010	2011	2012	2010–2012 Average
Total Residential[7]	**364,300**	**365,500**	**351,400**	**360,400**
By Heat Source				
Cigarette, Other Tobacco Products	**10,400**	**10,700**	**11,600**	**10,900**
Match	**600**	**600**	**500**	**600**
Lighter	**1,600**	**1,700**	**1,700**	**1,700**
Candle	**6,700**	**6,600**	**6,100**	**6,500**
By Item First Ignited				
Upholstered Furniture	**4,900**	**5,100**	**4,500**	**4,900**
Smoking Material Ignition	1,300	1,200	1,200	1,200
Open-Flame Ignition	600	700	600	600
Other	3,100	3,300	2,700	3,000
Mattress, Bedding	**7,800**	**7,800**	**7,300**	**7,700**
Smoking Material Ignition	1,400	1,500	1,500	1,500
Open-Flame Ignition	1,500	1,500	1,400	1,500
Other	4,900	4,900	4,300	4,700
Other Materials				
Cooking Materials[6]	152,800	152,400	158,500	154,600
Electric Cable Insulation	16,500	17,200	16,300	16,600
Interior Wall Covering	7,300	6,900	6,400	6,800
Wearing Apparel-Worn	300	300	300	300
Wearing Apparel-Not Worn	5,600	5,600	5,400	5,500
Floor Covering	3,900	3,800	3,500	3,700
Curtains, Drapes	1,500	1,400	1,400	1,500
Magazines, Newspaper	1,700	1,900	1,600	1,700
Thermal Insulation	5,900	6,100	5,200	5,700
Cabinet, Desk	4,900	4,500	4,500	4,600
Trash, Rubbish[6]	20,000	20,900	22,300	21,100
Toy, Game	100	200	200	200
Box, Carton, Bag, Basket, Barrel	2,600	2,600	2,600	2,600

Source: U. S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Subtotals do not necessarily add up to heading totals. Estimates exclude intentionally set fires.

[7] There are confined fire estimates included in *Total Residential, Cooking Materials*, and *Trash, Rubbish* categories. Estimates for confined cooking fires are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 8a on p. 31 for details.

TABLE 2b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED PRODUCTS, 2010–2012

Product	2010	2011	2012	2010–2012 Average
Total Residential[8]	**2,330**	**2,240**	**1,960**	**2,170**
By Heat Source				
Cigarette, Other Tobacco Products	**460**	**410**	**420**	**430**
Match	**20**	*****	**10**	**10**
Lighter	**90**	**90**	**40**	**70**
Candle	**80**	**90**	**80**	**80**
By Item First Ignited				
Upholstered Furniture	**410**	**390**	**370**	**390**
Smoking Material Ignition	220	160	140	170
Open-Flame Ignition	80	40	20	50
Other	120	190	210	180
Mattress, Bedding	**300**	**360**	**350**	**340**
Smoking Material Ignition	80	150	150	130
Open-Flame Ignition	30	50	30	40
Other	190	170	170	170
Other Materials				
Cooking Materials[7]	150	170	100	140
Electric Cable Insulation	80	110	100	100
Interior Wall Covering	160	80	90	110
Wearing Apparel-Worn	90	100	70	90
Wearing Apparel-Not Worn	50	30	20	30
Floor Covering	100	40	80	80
Curtains, Drapes	10	10	10	10
Magazines, Newspaper	30	50	30	40
Thermal Insulation	10	*	*	*
Cabinet, Desk	50	50	30	50
Trash, Rubbish	40	30	20	30
Toy, Game	*	*	*	*
Box, Carton, Bag, Basket, Barrel	20	20	30	20

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

[8] There were no NFIRS confined cooking fire deaths in 2010 or 2012 and a rounded estimate of fewer than 10 in 2011.

TABLE 2c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED PRODUCTS, 2010–2012

Product	2010	2011	2012	2010–2012 Average
Total Residential[9]	**12,910**	**13,400**	**11,860**	**12,720**
By Heat Source				
Cigarette, Other Tobacco Products	**1,070**	**1,180**	**930**	**1,060**
Match	**70**	**70**	**110**	**80**
Lighter	**380**	**410**	**320**	**370**
Candle	**620**	**740**	**590**	**650**
By Item First Ignited				
Upholstered Furniture	**710**	**710**	**610**	**670**
Smoking Material Ignition	240	220	210	220
Open-Flame Ignition	120	140	90	120
Other	350	350	310	330
Mattress, Bedding	**1,190**	**1,250**	**1,090**	**1,180**
Smoking Material Ignition	330	350	270	320
Open-Flame Ignition	270	320	310	300
Other	590	580	510	560
Other Materials				
Cooking Materials[8]	4,250	4,290	4,110	4,210
Electric Cable Insulation	460	430	450	450
Interior Wall Covering	330	320	270	310
Wearing Apparel-Worn	110	110	70	100
Wearing Apparel-Not Worn	310	360	320	330
Floor Covering	230	300	250	260
Curtains, Drapes	190	160	130	160
Magazines, Newspaper	120	190	120	140
Thermal Insulation	90	90	120	100
Cabinet, Desk	310	330	270	300
Trash, Rubbish[8]	320	300	260	290
Toy, Game	*	30	10	10
Box, Carton, Bag, Basket, Barrel	120	90	100	110

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[9]There are confined fire injury estimates included in *Total Residential*, *Cooking Materials*, and *Trash, Rubbish* categories. Estimates for confined cooking fire injuries are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 8b on p. 32 for details.

TABLE 2d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED PRODUCTS, 2010–2012

Product	2010	2011	2012	2010–2012 Average
Total Residential[10]	**$6,627.6**	**$6,457.1**	**$6,380.7**	**$6,488.5**
By Heat Source				
Cigarette, Other Tobacco Products	**$384.2**	**$392.6**	**$431.9**	**$402.9**
Match	**$23.9**	**$12.5**	**$16.8**	**$17.7**
Lighter	**$56.9**	**$52.0**	**$69.1**	**$59.3**
Candle	**$257.3**	**$236.0**	**$216.5**	**$236.6**
By Item First Ignited				
Upholstered Furniture	**$249.0**	**$265.2**	**$222.4**	**$245.5**
Smoking Material Ignition	$61.0	$72.3	$59.9	$64.4
Open-Flame Ignition	$34.9	$32.2	$29.5	$32.2
Other	$153.1	$160.7	$133.0	$148.9
Mattress, Bedding	**$297.8**	**$296.8**	**$259.3**	**$284.7**
Smoking Material Ignition	$43.8	$53.4	$47.2	$48.1
Open-Flame Ignition	$70.2	$70.6	$53.2	$64.7
Other	$183.9	$172.8	$158.9	$171.9
Other Materials				
Cooking Materials[9]	$508.9	$521.8	$522.8	$517.8
Electric Cable Insulation	$449.2	$478.1	$447.7	$458.3
Interior Wall Covering	$329.9	$290.5	$296.7	$305.7
Wearing Apparel-Worn	$4.6	$7.5	$15.6	$9.2
Wearing Apparel-Not Worn	$127.5	$118.0	$127.0	$124.2
Floor Covering	$129.7	$117.5	$130.7	$126.0
Curtains, Drapes	$52.7	$91.0	$37.6	$60.4
Magazines, Newspaper	$64.9	$60.2	$82.4	$69.1
Thermal Insulation	$153.0	$172.2	$149.9	$158.3
Cabinet, Desk	$167.0	$167.3	$179.5	$171.3
Trash, Rubbish[9]	$206.7	$150.7	$158.8	$172.1
Toy, Game	$2.7	$2.7	$3.9	$3.1
Box, Carton, Bag, Basket, Barrel	$82.1	$82.8	$108.6	$91.2

Source: U. S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[10] There are confined fire property loss estimates included in *Total Residential, Cooking Materials,* and *Trash, Rubbish* categories. Estimates for confined cooking fire property losses are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 8c on p. 32 for details.

TABLE 3a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
HEATING AND COOLING EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[11]	**364,300**	**365,500**	**351,400**	**360,400**
Total Heating and Cooling Equipment[10]	**48,600**	**45,400**	**41,800**	**45,300**
Solid Fuel	**2,400**	**2,100**	**1,900**	**2,100**
Fixed Heater	600	500	500	500
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	1,800	1,600	1,300	1,500
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	**3,000**	**2,700**	**2,100**	**2,600**
Fixed Heater	900	800	700	800
Portable Heater	200	100	100	100
Fireplace, Chimney, Chimney Connector	200	100	100	200
Central Heating	500	400	300	400
Water Heater	1,000	1,000	700	900
Fixed, Central Air Conditioning	*	*	*	*
Other	300	200	200	200
Electric	**8,900**	**8,900**	**8,300**	**8,700**
Fixed Heater	2,400	2,500	2,500	2,500
Portable Heater	1,100	1,100	1,000	1,100
Central Heating	400	400	300	400
Water Heater	800	900	700	800
Fixed, Central Air Conditioning	700	700	800	800
Portable Air Conditioner	300	400	400	300
Other	3,800	3,700	3,400	3,600
Liquid Fuel	**400**	**300**	**200**	**300**
Fixed Heater	100	100	*	100
Portable Heater	200	200	100	200
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	100	100	*	100
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	**100**	**100**	**100**	**100**

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[11] There are confined fire estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8a on p. 31 for details.

TABLE 3b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
HEATING AND COOLING EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[12]	**2,330**	**2,240**	**1,960**	**2,170**
Total Heating and Cooling Equipment	**200**	**160**	**210**	**190**
Solid Fuel	**30**	**40**	**50**	**40**
Fixed Heater	20	20	40	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	10	20	20	20
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	**50**	**30**	**40**	**40**
Fixed Heater	*	20	20	10
Portable Heater	10	*	*	*
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	10	*	20	10
Water Heater	30	*	*	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	10	*	*
Electric	**80**	**70**	**110**	**90**
Fixed Heater	10	30	30	20
Portable Heater	60	30	60	50
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	10	*	10	10
Other	*	10	10	10
Liquid Fuel	**30**	**10**	*****	**20**
Fixed Heater	*	*	*	*
Portable Heater	30	*	*	10
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	10	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	*	*	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

[12] There were no NFIRS confined cooking fire deaths in 2010 or 2012 and a rounded estimate of fewer than 10 in 2011.

TABLE 3c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
HEATING AND COOLING EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[13]	**12,910**	**13,400**	**11,860**	**12,720**
Total Heating and Cooling Equipment[12]	**940**	**980**	**790**	**900**
Solid Fuel	**110**	**80**	**70**	**80**
Fixed Heater	30	30	30	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	70	50	40	50
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	**230**	**220**	**130**	**190**
Fixed Heater	60	90	40	70
Portable Heater	10	20	10	10
Fireplace, Chimney, Chimney Connector	10	*	*	10
Central Heating	40	10	20	20
Water Heater	80	80	40	60
Fixed, Central Air Conditioning	*	*	*	*
Other	20	20	10	20
Electric	**490**	**560**	**510**	**520**
Fixed Heater	160	260	260	220
Portable Heater	140	110	60	110
Central Heating	10	10	10	10
Water Heater	20	10	10	10
Fixed, Central Air Conditioning	10	40	30	30
Portable Air Conditioner	30	30	40	30
Other	150	150	130	140
Liquid Fuel	**40**	**50**	**30**	**40**
Fixed Heater	*	*	*	*
Portable Heater	30	30	20	30
Fireplace, Chimney, Chimney Connector	*	10	*	*
Central Heating	*	10	10	*
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	*****	*****	*****	*****

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[13] There are confined fire injury estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8b on p. 32 for details.

TABLE 3d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
HEATING AND COOLING EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[14]	**$6,627.6**	**$6,457.1**	**$6,380.7**	**$6,488.5**
Total Heating and Cooling Equipment[13]	**$579.7**	**$466.5**	**$425.2**	**$490.5**
Solid Fuel	**$128.3**	**$99.0**	**$102.5**	**$109.9**
Fixed Heater	$22.8	$24.4	$21.7	$23.0
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	$101.7	$71.5	$78.9	$84.0
Central Heating	$3.4	$1.2	$1.0	$1.9
Water Heater	*	$0.2	*	$0.1
Other	$0.3	$1.7	$0.9	$1.0
Gas-Fired	**$103.9**	**$103.6**	**$72.1**	**$93.2**
Fixed Heater	$21.5	$21.8	$19.2	$20.8
Portable Heater	$12.7	$2.4	$5.2	$6.8
Fireplace, Chimney, Chimney Connector	$15.4	$9.1	$7.6	$10.7
Central Heating	$16.7	$19.8	$9.7	$15.4
Water Heater	$27.7	$42.8	$20.0	$30.2
Fixed, Central Air Conditioning	$0.2	$0.5	$0.1	$0.3
Other	$9.8	$7.2	$10.3	$9.1
Electric	**$259.2**	**$242.8**	**$234.0**	**$245.3**
Fixed Heater	$63.6	$57.0	$57.5	$59.4
Portable Heater	$64.3	$37.6	$43.6	$48.5
Central Heating	$6.6	$11.8	$7.3	$8.5
Water Heater	$9.0	$10.1	$10.6	$9.9
Fixed, Central Air Conditioning	$23.6	$15.5	$20.6	$19.9
Portable Air Conditioner	$6.5	$11.7	$12.1	$10.1
Other	$109.3	$114.6	$102.8	$108.9
Liquid Fuel	**$15.6**	**$9.4**	**$6.7**	**$10.6**
Fixed Heater	$1.2	$1.2	$1.4	$1.3
Portable Heater	$8.2	$4.7	$3.2	$5.4
Fireplace, Chimney, Chimney Connector	*	*	$0.1	*
Central Heating	$1.6	$2.2	$1.3	$1.7
Water Heater	$1.0	*	$0.4	$0.5
Other	$3.5	$1.2	$0.3	$1.7
All Other Fuel	**$4.5**	**$3.7**	**$1.4**	**$3.2**

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Rounded estimates less than $0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[14] There are confined fire property loss estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8c on p. 32 for details.

TABLE 4a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED ELECTRICAL EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[15]	**364,300**	**365,500**	**351,400**	**360,400**
Total Electrical	**43,700**	**44,500**	**42,600**	**43,600**
Electric Heating and Cooling	**8,900**	**8,900**	**8,300**	**8,700**
Central Heating	400	400	300	400
Local Fixed Heater	2,400	2,500	2,500	2,500
Portable Heater	1,100	1,100	1,000	1,100
Water Heater	800	900	700	800
Fixed, Central Air Conditioning	700	700	800	800
Portable Air Conditioner	300	400	400	300
Other	3,800	3,700	3,400	3,600
Electric Cooking Equipment	**13,700**	**13,700**	**14,100**	**13,800**
Range/Oven	11,600	11,600	11,300	11,500
Range/Oven Hood	100	200	200	200
Deep Fat Fryer	100	100	100	100
Grill	*	*	*	*
Microwave Oven	500	600	600	600
Small Heat-Producing Appliance	500	500	500	500
Other	1,800	1,900	2,600	2,100
Electrical Distribution	**9,400**	**9,800**	**9,500**	**9,600**
Installed Wiring	3,700	3,900	4,400	4,000
Light Fixture	1,200	1,200	1,000	1,100
Receptacle, Switch	1,100	1,200	1,200	1,200
Cord, Plug	900	1,100	900	1,000
Lamp, Light Bulb	700	700	500	600
Panel Board	600	500	500	500
Meter	300	300	300	300
Transformer	100	100	*	100
Other	800	900	700	800
Other Selected Electrical Appliances	**6,900**	**7,200**	**6,000**	**6,700**
Clothes Dryer	4,800	5,100	4,100	4,700
Dishwasher	500	400	400	400
Audio/Visual Equipment	300	400	300	400
Washing Machine	300	200	200	200
Refrigerator/Freezer	700	700	500	600
Shop/Garden Tools	200	300	300	300
Torch	100	100	100	100

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[15] There are confined fire estimates included in *Total Residential* category. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8a on p. 31 for details.

TABLE 4b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED ELECTRICAL EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[16]	**2,330**	**2,240**	**1,960**	**2,170**
Total Electrical	**450**	**400**	**420**	**420**
Electric Heating and Cooling	**80**	**70**	**110**	**90**
Central Heating	*	*	*	*
Local Fixed Heater	10	20	30	20
Portable Heater	60	40	60	50
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	10	*	10	10
Other	*	10	10	10
Electric Cooking Equipment	**120**	**140**	**110**	**120**
Range/Oven	120	110	90	110
Range/Oven Hood	*	*	*	*
Deep Fat Fryer	*	*	*	*
Grill	*	*	*	*
Microwave Oven	*	*	*	*
Small Heat-Producing Appliance	*	10	20	10
Other	*	30	20	20
Electrical Distribution	**140**	**120**	**130**	**130**
Installed Wiring	30	50	80	50
Light Fixture	*	10	10	10
Receptacle, Switch	10	*	*	*
Cord, Plug	60	40	30	40
Lamp, Light Bulb	30	10	10	10
Panel Board	*	*	*	*
Meter	*	*	*	*
Transformer	*	*	*	*
Other	10	10	10	10
Other Selected Electrical Appliances	**20**	**10**	**10**	**10**
Clothes Dryer	*	*	*	*
Dishwasher	*	*	*	*
Audio/Visual Equipment	*	*	*	*
Washing Machine	10	*	*	*
Refrigerator/Freezer	*	10	10	10
Shop/Garden Tool	*	*	*	*
Torch	*	*	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

[16] There were no NFIRS confined fire deaths in 2010 or 2012 and a rounded estimate of fewer than 10 confined cooking fire deaths in 2011.

TABLE 4c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED ELECTRICAL EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[17]	**12,910**	**13,400**	**11,860**	**12,720**
Total Electrical	**2,940**	**3,250**	**2,970**	**3,050**
Electric Heating and Cooling	**490**	**560**	**510**	**520**
Central Heating	10	10	10	10
Local Fixed Heater	160	260	260	220
Portable Heater	140	110	60	110
Water Heater	20	10	10	10
Fixed, Central Air Conditioning	10	40	30	30
Portable Air Conditioner	30	30	40	30
Other	150	140	130	140
Electric Cooking Equipment	**1,410**	**1,640**	**1,460**	**1,500**
Range/Oven	1,290	1,480	1,200	1,320
Range/Oven Hood	*	10	10	10
Deep Fat Fryer	10	10	20	10
Grill	*	*	*	*
Microwave Oven	30	50	30	40
Small Heat-Producing Appliance	60	50	50	50
Other	110	140	230	160
Electrical Distribution	**500**	**440**	**460**	**470**
Installed Wiring	140	130	170	140
Light Fixture	80	30	40	50
Receptacle, Switch	20	70	60	50
Cord, Plug	110	70	80	90
Lamp, Light Bulb	50	60	50	50
Panel Board	20	20	20	20
Meter	30	20	10	20
Transformer	*	*	*	*
Other	50	30	40	40
Other Selected Electrical Appliances	**190**	**300**	**240**	**250**
Clothes Dryer	140	180	130	150
Dishwasher	*	10	20	10
Audio/Visual Equipment	20	30	40	30
Washing Machine	10	*	10	*
Refrigerator/Freezer	10	60	40	40
Shop/Garden Tool	*	20	10	10
Torch	10	10	*	10

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[17] There are confined fire injury estimates included in *Total Residential* category. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8b on p. 32 for details.

TABLE 4d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED ELECTRICAL EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[18]	**$6,627.6**	**$6,457.1**	**$6,380.7**	**$6, 488.5**
Total Electrical	**$1,134.5**	**$1,137.8**	**$1, 207.6**	**$1,160.0**
Electric Heating and Cooling	**$259.2**	**$245.2**	**$234.0**	**$246.1**
Central Heating	$6.6	$11.9	$7.3	$8.6
Local Fixed Heater	$63.6	$57.6	$57.5	$59.6
Portable Heater	$64.3	$38.0	$43.6	$48.7
Water Heater	$9.0	$10.2	$10.6	$9.9
Fixed, Central Air Conditioning	$23.6	$15.6	$20.6	$19.9
Portable Air Conditioner	$6.5	$11.8	$12.1	$10.1
Other	$109.3	$115.7	$102.8	$109.3
Electric Cooking Equipment	**$268.9**	**$274.9**	**$338.7**	**$294.1**
Range/Oven	$213.9	$220.8	$265.4	$233.4
Range/Oven Hood	$0.9	$1.2	$3.9	$2.0
Deep Fat Fryer	$4.7	$6.7	$2.6	$4.6
Grill	$0.9	$2.9	$0.9	$1.6
Microwave Oven	$9.6	$8.8	$11.3	$9.9
Small Heat-Producing Appliance	$14.6	$26.7	$18.2	$19.9
Other	$48.5	$43.3	$65.9	$52.6
Electrical Distribution	**$311.1**	**$340.2**	**$334.1**	**$328.5**
Installed Wiring	$137.8	$143.6	$170.2	$150.5
Light Fixture	$31.5	$29.3	$25.0	$28.6
Receptacle, Switch	$26.4	$33.1	$34.5	$31.3
Cord, Plug	$35.8	$39.8	$35.9	$37.1
Lamp, Light Bulb	$20.1	$20.7	$15.0	$18.6
Panel Board	$18.3	$7.6	$12.2	$12.7
Meter	$3.0	$8.0	$7.9	$6.3
Transformer	$1.3	$1.7	$1.9	$1.6
Other	$36.9	$56.5	$31.4	$41.6
Other Selected Electrical Appliances	**$128.8**	**$113.9**	**$126.0**	**$122.9**
Clothes Dryer	$60.5	$68.0	$63.4	$64.0
Dishwasher	$11.4	$11.0	$11.1	$11.2
Audio/Visual Equipment	$6.6	$8.4	$14.7	$9.9
Washing Machine	$2.1	$2.1	$2.5	$2.2
Refrigerator/Freezer	$32.7	$16.8	$20.0	$23.2
Shop/Garden Tool	$13.0	$6.2	$8.3	$9.2
Torch	$2.5	$1.3	$5.9	$3.3

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Estimates are rounded to the $0.1m. Rounded estimates less than $0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[18] There are confined fire property loss estimates included in *Total Residential* category. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8c on p. 32 for details.

TABLE 5a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED GAS-FIRED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[19]	**364,300**	**365,500**	**351,400**	**360,400**
Total Gas-Fired Equipment	**8,100**	**8,000**	**6,700**	**7,600**
Gas Heating Equipment	**3,000**	**2,700**	**2,100**	**2,600**
Fixed Heater	900	800	700	800
Portable Heater	200	100	100	100
Central Heating	500	400	300	400
Fireplace, Chimney, Connector	200	100	100	200
Water Heater	1,000	1,000	700	900
Fixed, Central Air Conditioning	*	*	*	*
Other	300	200	200	200
Gas Cooking Equipment	**2,700**	**2,900**	**2,700**	**2,800**
Range/Oven	1,900	1,900	1,800	1,900
Open Gas Grill	400	500	500	500
Other	400	400	400	400
Other Selected Gas Equipment	**2,000**	**2,100**	**1,500**	**1,900**
Clothes Dryer	1,400	1,500	1,000	1,300
Torch	300	300	300	300
Shop/Garden Tool	300	300	300	300

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude losses from intentionally set fires.

[19] There are confined fire estimates included in *Total Residential* category. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8a on p. 31 for details.

TABLE 5b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED GAS-FIRED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[20]	**2,330**	**2,240**	**1,960**	**2,170**
Total Gas-Fired Equipment	**110**	**90**	**70**	**90**
Gas Heating Equipment	**50**	**30**	**40**	**40**
Fixed Heater	*	20	20	10
Portable Heater	10	*	*	*
Central Heating	10	*	20	10
Fireplace, Chimney, Connector	*	*	*	*
Water Heater	30	*	*	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	10	*	*
Gas Cooking Equipment	**60**	**50**	**20**	**40**
Range/Oven	50	40	10	40
Open Gas Grill	*	10	*	*
Other	10	*	10	*
Other Selected Gas Equipment	**10**	*****	**10**	*****
Clothes Dryer	10	*	*	*
Torch	*	*	*	*
Shop/Garden Tool	*	*	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

[20]There were no NFIRS confined fire deaths in 2010 or 2012 and a rounded estimate of fewer than 10 confined cooking fire deaths in 2011.

TABLE 5c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED GAS-FIRED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[21]	**12,910**	**13,400**	**11,860**	**12,720**
Total Gas-Fired Equipment	**660**	**650**	**480**	**590**
Gas Heating Equipment	**230**	**220**	**130**	**190**
Fixed Heater	60	90	40	70
Portable Heater	10	20	10	10
Central Heating	40	10	20	20
Fireplace, Chimney, Connector	10	*	*	10
Water Heater	80	80	40	60
Fixed, Central Air Conditioning	*	*	*	*
Other	20	20	10	20
Gas Cooking Equipment	**280**	**240**	**260**	**260**
Range/Oven	210	170	180	190
Open Gas Grill	40	20	20	30
Other	30	40	60	40
Other Selected Gas Equipment	**90**	**130**	**70**	**90**
Clothes Dryer	50	80	40	60
Torch	20	30	20	20
Shop/Garden Tool	20	20	10	20

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[21] There are confined fire injury estimates included in *Total Residential* category. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8b on p. 32 for details.

TABLE 5d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED GAS-FIRED EQUIPMENT, 2010–2012

Equipment	2010	2011	2012	2010–2012 Average
Total Residential[22]	**$6,627.6**	**$6,434.9**	**$6,380.7**	**$6,481.1**
Total Gas-Fired Equipment	**$250.0**	**$241.9**	**$205.0**	**$232.3**
Gas Heating Equipment	**$103.9**	**$103.6**	**$72.1**	**$93.2**
Fixed Heater	$21.5	$21.8	$19.2	$20.8
Portable Heater	$12.7	$2.4	$5.2	$6.8
Central Heating	$16.7	$19.8	$9.7	$15.4
Fireplace, Chimney, Connector	$15.4	$9.1	$7.6	$10.7
Water Heater	$27.7	$42.8	$20.0	$30.2
Fixed, Central Air Conditioning	$0.2	$0.5	$0.1	$0.3
Other	$9.8	$7.2	$10.3	$9.1
Gas Cooking Equipment	**$89.3**	**$76.8**	**$85.7**	**$83.9**
Range/Oven	$39.6	$32.6	$38.6	$36.9
Open Gas Grill	$32.2	$33.1	$34.8	$33.4
Other	$17.5	$11.1	$12.3	$13.6
Other Selected Gas Equipment	**$43.4**	**$49.9**	**$34.5**	**$42.6**
Clothes Dryer	$15.8	$13.4	$16.6	$15.3
Torch	$10.5	$10.9	$6.7	$9.4
Shop/Garden Tool	$17.1	$25.5	$11.2	$17.9

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Rounded estimates less than $0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[22] There are confined fire property loss estimates included in *Total Residential* category. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8c on p. 32 for details.

Methodology

The Methodology section is divided into five major sections. Section 1 describes the data from which fire loss estimates were made; Section 2 describes the procedures for preparing the data and dealing with missing data; Section 3 describes the quality control checking and correction of the data; Section 4 describes how the fire loss estimates were made; and Section 5 describes other issues that relate to the data and the estimates.

Data

Sources of Data for Fire Loss Estimates

The estimates in this report are based on the National Fire Protection Association's (NFPA) Survey of Fire Departments and the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) data.

The NFPA survey is a stratified random sample of fire departments in the United States.[23] The sample is stratified by the size of the community protected. The NFPA makes national estimates of aggregated fires, deaths, injuries, and property loss, by weighting sample results according to the proportion of the total U.S. population accounted for by communities of each size. The table below shows the NFPA estimates of residential structure fires and the associated losses for 2010 through 2012.

Table 6. NFPA Estimates of Residential Structure Fires and Associated Losses 2010–2012

	2010	2011	2012
Structure Fires	384,000	386,000	381,000
Civilian Deaths	2,665	2,550	2,405
Civilian Injuries	13,800	14,360	13,175
Property Loss	$7.08 billion	$7.05 billion	$7.20 billion

Source: See footnote 23 below.

The table above contains the only data from the NFPA survey that is used by CPSC staff for making fire loss estimates.

The NFIRS is a compilation of incident reports submitted voluntarily to the U.S. Fire Administration (USFA) by U.S. fire departments. As such, the NFIRS is not a probability sample and is insufficient to support precision estimation. The reports come from all 50 states, the District of Columbia, and U.S. territories in each of the three years (2010, 2011, and 2012). Not all the states reporting included data from every fire department in the state. The number of fire departments participating in NFIRS increased from 21,502 in 2010, to 21,915 in 2011, to 21,960 in 2012. Table 7 shows the number of residential structure fires and the corresponding losses reported to USFA during the years 2010 through 2012.

[23] M.J. Karter, "Fire Loss in the U.S. During 2010," National Fire Protection Association (NFPA), September 2011; M.J. Karter, "Fire Loss in the U.S. During 2011," National Fire Protection Association (NFPA), September 2012; M.J. Karter, "Fire Loss in the U.S. During 2012," National Fire Protection Association (NFPA), September 2013.

Table 7. Residential Structure Fires and Associated Losses Reported to NFIRS 2010–2012

	2010	2011	2012
Structure Fires	287,475	286,136	253,379
Civilian Deaths	1,530	1,512	1,393
Civilian Injuries	8,207	8,273	7,266
Property Loss	$4.21 billion	$4.21 billion	$3.85 billion

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA.

According to the NFPA, there was an estimated annual average of 383,700 residential structure fires in the U.S. during 2010 to 2012 and an annual average of 2,540 deaths, 13,780 injuries, and $7.1 billion in property losses during that time period (Table 6). NFIRS captured about 72 percent of these fires, 58 percent of the deaths, 57 percent of the injuries, and 58 percent of the property loss (Table 7).

NFIRS Variables

The NFIRS version 5.0 coding system includes many variables, but CPSC staff used only a few for this report. The list of variables used by CPSC staff is shown below.

Variable	Description
Civilian Deaths	Number of people who died in connection with the fire incident other than fire service personnel.
Civilian Injuries	Number of people who were injured (but did not die) in connection with the fire incident other than fire service personnel.
Property Loss	Estimate of loss, in whole dollars, if structure sustained damage from flame, smoke, or suppression efforts. Property loss is not adjusted for inflation.
Contents Loss	Estimate of loss in whole dollars for contents (which had value) that sustained damage from flame, smoke, suppression efforts, or otherwise. Contents loss is not adjusted for inflation.
Property Use	Refers to the specific use of the property where the incident occurred. For residential structure fires, the properties that were deemed appropriate were single/ multifamily dwellings, any type of boarding houses, dormitories, sorority/fraternity houses, hotels/motels, and mobile property not in transit.

Incident Type	Identifies the various types of incidents to which fire departments respond. It may include fires, rescue and emergency medical services, false alarms. For this report, the incident codes of interest included structure fires (which include confined fires) and fires in mobile and portable structures used as fixed residences.
Equipment Involved	Device that provided the heat which started the fire (*e.g*., heater, clothes dryer).
Power Source	The type of power for the equipment involved in the fire's ignition. These are grouped into electrical, gas-fueled, liquid-fueled, solid-fueled, and other.
Equipment Portability	Identifies the equipment involved as stationary or portable.
Heat Source	Source of heat that ignited the fire (*e.g*., candle, lighter, cigarette, heat from operating equipment, hot object).
Item First Ignited	The functional description or use of that item which was first ignited by the heat source (*e.g*., upholstered furniture, mattress, bedding, electric cable insulation, curtains or drapes).
Cause of Ignition	The general causal factor that resulted in a heat source igniting a combustible material. The cause code values are: 1: intentional 2: unintentional 3: failure of equipment or heat source 4: act of nature 5: cause under investigation 0: cause, other U: cause undetermined after investigation. CPSC staff regrouped the codes as: 1: intentional 0, 2, 3, 4 or fire involving child play*: unintentional 5, U, missing information: unknown.
Factors Contributing to Ignition	The event that allowed the heat source and the item first ignited to combine to start the fire. These add specificity to the cause of ignition, such as playing with heat source, heat source too close to combustibles, equipment malfunction.

* See discussion on child play later in this section.

Human Factors Contributing to Ignition	Factors relating to the person or persons involved with the start of the fire. Examples are asleep, possibly impaired by alcohol or drugs, age, unattended or unsupervised person.
Age	Age of the person, if age was considered a factor in contributing to the ignition of the fire.

The NFIRS coding manual defines some variables as "required fields", that is, if known, values must be supplied for those variables. Other variables may or may not be supplied at the discretion of the reporting department. In the list above, the categories Equipment Involved, Power Source, Equipment Portability, Factors Contributing to Ignition, Human Factors Contributing to Ignition, and Age are not required fields. In the change that was incorporated beginning with 2012 data, Equipment Involved became required if certain Heat Source or Factor Contributing to Ignition codes were coded. Variables that are not required are more likely to be missing from a given fire incident report in NFIRS than those that are required.[24]

In the change that was incorporated beginning with 2012 data, Equipment Involved became required if certain Heat Source or Factor Contributing to Ignition codes were coded. This, not surprisingly, has led to there being a smaller proportion of missing data for Equipment Involved in 2012. Because the code 'NNN – No equipment involved in ignition' was also not permitted for fires with these particular Heat Source and Factor Contributing to Ignition codes, the proportion of fires coded as 'NNN – No equipment involved in ignition' is much lower in 2012 than in previous years. Requiring an Equipment Involved to be coded if certain Heat Source[25] codes are coded, also appears to have led to fewer fires being coded with those Heat Source codes in 2012.

Data Preparation—Addressing Different Types of Missing Data

There are four general types of missing data in NFIRS: (1) data where the value of the missing variable can be inferred logically; (2) missing data from exposure fires; (3) missing data from confined fires; and (4) other missing data. Standard practice in analysis of fire data over the last 20 years has been to fill in the missing values whenever possible.

Missing data that can be logically inferred

As mentioned above, only a few of the available fire incident characteristics were used to generate estimates in this report. Of these, only the variables Incident Type, Property Use, Cause of Ignition, Item First Ignited, Heat Source, and the Loss variables are required to be filled out by the fire departments. Even fewer are required for confined fires, which will be discussed below. Tables 1, 3, 4, and 5 in this report rely heavily on the variables Equipment Involved and Equipment Power Source. To reduce the extent of missing data, CPSC staff has implemented some conventions, as necessary, following consultation with USFA technical staff. For example, if the heat source is known to be matches, lighters, or candles, and no equipment is reported, then it is likely that equipment was not involved, rather than equipment being unknown. Similarly, if the factor contributing to the ignition of a fire is reported to be an act of nature— such as an earthquake or a storm—and no equipment is reported, then it is likely that no equipment was involved.

[24] NFIRS Complete Reference Guide, January 2013.

[25] There are four of these heat source codes: '10 – Heat from powered equipment, other'; '11 – Spark, ember, or flame from operating equipment'; '12 – Radiated, conducted heat from operating equipment'; '13 – Arcing'.

Another scenario is when the reported equipment code is electrical but the equipment power source is missing. In this case, it is evident that the power source should have been reported as electrical. Similarly, when it is known that there is no electrical equipment involved, the power source should be reported as "none" instead of "unknown."

These changes are made before any other steps in data preparation.

Exposure fires

Some fires involved more than one residential structure. The initial structure is identified as "exposure zero" in the data file. Structure fires that spread from the initial fire are identified as "exposure fires" numbered from "zero" up to as many as are necessary. Typically, in exposure fires, most of the information on the variables listed above is not filled out for exposures beyond the initial home.

If the initial fire was a residential structure fire, CPSC staff transferred the fire cause values such as Cause of Ignition, Equipment Involved, or Heat Source, from the initial fire to the exposure fire. Thus, if a portable heater caused the initial fire, all exposures would be considered portable heater fires. All associated deaths, injuries, and property losses in these exposures also would be attributed to portable heaters. Any residential structure exposure fire that originated from a non-residential structure fire is also considered in-scope for this report. If the initial fire is not a residential structure fire, but the exposure fire is a residential structure fire, then the cause information is not passed down from the initial fire. For example, if a wildfire is started by a cigarette and then spreads to homes, the wildfire would not count as a residential structure fire, but the exposure home fires would. The cigarette as the heat source would not be passed on to the home fires in this case. The cause information for the exposure home fires would be left as is.

Confined fires

By far the biggest proportion of missing data was encountered among the confined fires. By NFIRS definition, a fire that is confined to a noncombustible container causing no flame damage beyond the container is considered to be confined.

In NFIRS version 5.0, the following Incident Type codes are used to identify the different types of confined fires.

Incident Type Code	*Definition*
113	Fire involving the contents of a cooking vessel without fire extension beyond the vessel.
114	Fire originating in and confined to a chimney or flue.
115	Fire caused by overload or malfunction of an incinerator, with no flame damage outside the incinerator.
116	Fire caused by delayed ignition or malfunction of a fuel or oil burner/boiler, with no flame damage outside the fire box.

117	Fire originating in and confined to contents of a trash compactor. Home trash compactors are excluded.
118	Fire involving a trash or rubbish fire in a structure with no flame damage to structure or its contents.

These Incident Type codes are unavailable in version 4.1 of NFIRS. It was believed that many of these cases were not being reported. So these codes were created in version 5.0 to simplify the coding of these fires. When reporting confined fires, the Cause of Ignition, Equipment Involved, Item First Ignited, and Power Source are not required and are rarely filled.

With the proportion of reported confined fires increasing, the proportion of missing data also increases. However, imputation of unknowns based on the information from confined fires is not a viable option. From the definition of the Incident Type of confined fires, it is unclear that they are at all similar to the rest of the fires in terms of the equipment involved, the equipment power source, the heat source, or the item first ignited. As such, CPSC staff separates all confined fires from the data before the product-specific estimates are derived. The confined fire and fire loss counts were weighted up to the NFPA estimates, using the same weights as the rest of the data and presented at the aggregate levels (and sometimes at more specific levels as allowed by the Incident Type definitions). See the section on Estimation Procedure below for a discussion of the weights used. Tables 8a through 8c present all estimates related to confined fires. These estimates are also included in Tables 1a through 5d, as appropriate. Note that they do not appear in Tables 4a through 5d at any of the specific levels because there is no information available on equipment power source.

Table 8a. Estimated Residential Confined Fires: 2010–2012

Included in Table Categories:	Appear in Tables:	2010	2011	2012
Total Residential	1a, 2a, 3a, 4a, 5a	180,600	178,900	183,600
Total Heating and Cooling Equipment	1a, 3a	33,800	31,300	29,300
Fireplace, Chimney, Connector	*1a, 3a*	*22,400*	*20,800*	*19,800*
Other (Burner/Boiler)	*1a, 3a*	*11,400*	*10,500*	*9,600*
Cooking	1a, 2a	129,900	129,500	135,200
Trash, Rubbish	2a	15,400	16,600	17,600
Incinerator	-	700	600	600
Trash Compactor	-	900	900	900

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

In 2010 and 2012 there were no reported confined fire deaths. In 2011 there was one reported confined fire cooking death which lead to an estimate of fewer than ten confined cooking fire deaths.

Table 8b. Estimated Residential Confined Fire Injuries: 2010–2012

Included in Table Categories:	Appear in Tables:	2010	2011	2012
Total Residential	1c, 2c, 3c, 4c, 5c	1,960	1,770	1,820
Total Heating and Cooling Equipment	1c, 3c	70	60	50
Fireplace, Chimney, Connector	*1c, 3c*	*30*	*30*	*20*
Other (Burner/Boiler)	*1c, 3c*	*40*	*30*	*30*
Cooking	1c, 2c	1,810	1,640	1,700
Trash, Rubbish	2c	70	70	60
Incinerator	-	*	*	10
Trash Compactor	-	*	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates rounded to nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

Table 8c. Estimated Residential Confined Fire Property Loss (In Millions): 2010–2012

Included in Table Categories:	Appear in Tables:	2010	2011	2012
Total Residential	1d, 2d, 3d, 4d, 5d	$37.7	$37.2	$38.5
Total Heating and Cooling Equipment	1d, 3d	$7.7	$8.1	$8.7
Fireplace, Chimney, Connector	*1d, 3d*	*$5.8*	*$5.9*	*$6.7*
Other (Burner/Boiler)	*1d, 3d*	*$1.9*	*$2.2*	*$2.0*
Cooking	1d, 2d	$27.1	$26.7	$27.0
Trash, Rubbish	2d	$2.3	$1.9	$2.3
Incinerator	-	$0.6	$0.4	$0.4
Trash Compactor	-	*	*	$0.1

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Rounded estimates less than $0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

Other missing data

Tables 9a–9c show the proportion of data missing after inferring missing data when appropriate. Since most of the data fields for confined fires were not reported, they were excluded from the tabulations. Note the large reduction in missing Equipment data that has resulted from the questionnaire change in 2012. This change also likely causes an increase in the proportion of missing heat source data.

Table 9a. Missing Data on Residential Structure Fires: 2010–2012

	2010	2011	2012
Cause of Ignition	33%	33%	36%
Heat Source	36%	37%	41%
Item First Ignited	36%	37%	39%
Equipment Involved	49%	49%	36%
Equipment Power	49%	49%	36%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the USFA. Table excludes confined fires.

Table 9b. Missing Data on Residential Structure Fire Deaths: 2010–2012

	2010	2011	2012
Cause of Ignition	57%	60%	59%
Heat Source	57%	58%	62%
Item First Ignited	59%	56%	62%
Equipment Involved	54%	56%	49%
Equipment Power	53%	57%	49%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the USFA. Table excludes deaths from confined fires.

Table 9c. Missing Data on Residential Structure Fire Injuries: 2010–2012

	2010	2011	2012
Cause of Ignition	35%	34%	37%
Heat Source	32%	32%	35%
Item First Ignited	32%	32%	34%
Equipment Involved	42%	40%	29%
Equipment Power	42%	40%	30%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the USFA. Table excludes injuries from confined fires.

For these data, an assumption was made that the unknown values for a characteristic had the same distribution as the known values for that characteristic. To allocate these unknowns for the various characteristics, "raking" was performed using a SAS® macro.[26] The raking procedure maintains the marginal distributions for the known data, while allocating the unknown data for all characteristics involved.[27] For each year, the raking procedure was applied separately for fires, deaths, injuries, and property loss.

Adjustment for 2012 Data

The questionnaire design changes in 2012 made it difficult to assume that unknown values would share the distribution of known values. That's because a reduction in unknowns for electrical equipment was introduced without similar reductions for other kinds of equipment. Likewise, the reduction in heat source for electrical equipment was not observed elsewhere. In order, to address this change an adjustment factor was applied prior to raking to restore the proportion of missing equipment and electrical equipment (Tables 1, 3, 4, and 5) and missing heat source and electrical heat source (Table 2) to the proportions observed over the 2009-2011 time period. While these adjustments made estimates appear more in line with what had been observed prior to 2012, it's possible that these adjustments could mute or magnify changes that actually occurred between 2011 and 2012. Estimates produced without these adjustments appeared too different from prior estimates to be credible, given how they were concentrated only in one kind of equipment and heat source.

[26] M. Battaglia, D. Hoaglin and D. Izrael, "To Rake or Not To Rake Is Not the Question Anymore with the Enhanced Raking Macro," SAS® Users Group International (SUGI) 29th Annual Conference, May 9–12, 2004, Paper #207-29.

[27] M.A. Greene, L.E. Smith, M.S. Levenson, S. Hiser, and J.H. Mah, "Raking Fire Data," Presented at the Federal Conference on Statistical Methodology, Arlington, VA, 2001.

Quality Control Checks of NFIRS Data

In 2006, a California home fire was reported to NFIRS with a $100 million property loss. Since this was unusually high, CPSC staff decided to assign the fire to CPSC field staff to investigate and confirm this large property loss value. The actual fire department estimate of property loss for the fire was $100,000. The property loss was corrected, and the weight used for property loss estimates was changed accordingly.

In light of this, CPSC staff did more quality control checking of the NFIRS data, beginning with the 2007 data. In 2010, 2011, and 2012, residential structure fires with reported property losses of $5 million or higher were assigned to CPSC field staff to confirm the high property loss estimate with the fire department. There were 30 such high property loss fires assigned for investigation. In 15 of them, the property loss estimate was confirmed. In the remaining 15, a different property loss estimate was obtained, and the data were corrected.

In addition to the quality control checking of high property loss fire reports, some quality control was carried out on multiple-death fire incidents for the 2010, 2011, and 2012 data. In cases with 3 or more civilian deaths reported, a search of the Internet was conducted to look for news articles and fire marshal reports to confirm (or add to) the fire cause information given in the NFIRS report. There were 96 cases (out of the 133 total cases with three or more fatalities) where it appeared that there might be information to conflict with or add to the information from the NFIRS report. These cases were assigned to field staff to contact the fire department and reconcile the information. As a result of these investigations, 53 of these cases had fire cause information edited. A common scenario was a report that had the "Cause of Ignition" variable "missing" or "unknown" and then changed to "unintentional," as a result of a CPSC field staff investigation. In some instances the investigation concludes that the deaths involved were not the result of a fire and the data are edited accordingly.

Estimation Procedure

After applying the conventions and the raking procedure previously discussed, the estimation process was carried out. For each year, CPSC staff computed weights for residential fires, civilian deaths, civilian injuries, and property and content losses, respectively, by dividing the NFPA estimated totals for these losses by the corresponding NFIRS totals. These weights were multiplied by the NFIRS product-specific frequency counts, which then were used to produce the estimates in the tables. As already mentioned, the confined fires were separated, and the estimates were computed separately.

The estimates presented in this report pertain to unintentional fires and fire losses only. To this end, CPSC analysts excluded all incidents where the "Cause of Ignition" could be identified as intentional. While fires involving children playing with the source of heat have become more difficult to identify in the new NFIRS system (see discussion in the next section), whenever such a fire could be identified, the CPSC analysts designated it as "unintentional," even if the "Cause of Ignition" was coded as "intentional."

Estimated annual averages recorded in this report are arithmetic averages of the unrounded estimates from each of the three years. The reported annual averages are rounded to the nearest 100 for fires, nearest 10 for deaths and injuries, and nearest $0.1 million for property losses.

Other Issues

Child Play

When a fire is caused by the act of a child (under 10 years of age) playing with a source of heat, the cause of fire is considered "Child Play."

In version 4.1 of NFIRS data, the variable "Ignition Factor" had specific codes to indicate the cause of the fire. The codes allowed for the identification of "Child Play" fire losses, which were associated with matches and lighters. In version 5.0, there is no one variable reserved to identify "Child Play" cases. A combination of variables, such as "Factors Contributing to Ignition," "Human Factors Contributing to Ignition," and "Age" (of fire starter when age was considered a factor contributing to ignition of fire) provides the means to identify these scenarios. However, for data that are reported in version 5.0, fire departments are not required to fill in these three variable fields. Consequently, much of the data are missing, and because these extra variables used to identify child play are not included in the raking procedure, estimates of "Child Play" fires (which were presented in pre-1999 years) have become unreliable for post-1998 years. However, for cases where these variables are not missing and are coded in a way that indicates child play, the "Cause of Ignition" variable is classified "unintentional." This ensures that the fire and any associated losses will be counted and not excluded as an intentional fire.

Trend in Estimates

From 1999 to 2004, the proportion of the NFIRS residential structure fire records that were originally coded in 5.0 increased rapidly (from 5 percent in 1999, to 89 percent in 2004). Because fires only can be coded as confined fires in 5.0, this rapid increase also meant a rapid increase in the proportion of fires that were confined fires (from 2 percent in 1999, to 41 percent in 2004). If the proportion of confined fires reported to NFPA did not increase likewise during this period, then this would have a downward effect on the fire estimates for nonconfined fire products. Without knowing whether fires reported to NFPA were confined or nonconfined, a review of the specific product fire estimates from 1999 to 2004 suggested that this downward effect was occurring. Because we do not know the change in the proportion of confined fires in the NFPA survey, we cannot be sure that this is indeed what was causing this decrease in fire estimates for specific products.

By 2005, 94 percent of the NFIRS residential structure fire records were originally coded in 5.0. As a result, the proportion of NFIRS structure fires that are confined fires did not increase much from 2005 to 2012 (42 percent to 48 percent). This small increase probably has little effect on the fire estimates for specific products.